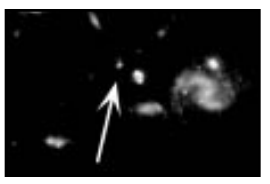
National Aeronautics and Space Administration

Lyndon B. Johnson Space Center
Houston, Texas

Chamber challenge

Four JSC volunteers spend 30 days in a test chamber recycling air, water. Story on Page 3.



Distant galaxy

The Hubble Space Telescope captures images of distant galaxies thought to be the oldest in universe. Story on Page 4.

Space News Roundup

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NASA selects Lockheed Martin to build X-33

Half scale model of reusable launch vehicle 'VentureStar' to fly in 1999

Vice President Al Gore announced Tuesday that Lockheed Martin has been selected to build the X-33 test vehicle.

A one-half scale model of the Reusable Launch Vehicle will be used to demonstrate advanced technologies that will dramatically increase reliability and lower the costs of putting payloads into space.

Lockheed Martin will design, build and conduct the first test flight of the X-33 test vehicle by March 1999, and conduct at least fifteen flights by December 1999. NASA has budgeted $941 million for the project through 1999. Lockheed Martin will invest $220 million in its X-33 design.

Called "VentureStar," the Lockheed Martin design is based on a lifting body shape with a radical new aerospike engine and a rugged metallic thermal protection system which would be launched vertically like a rocket and land horizontally like an airplane.

"The RLV program is a radical departure from the way NASA has done business in the past," NASA Administrator Daniel S. Goldin said. "Our role is to develop the high risk technologies that industry cannot afford. But we won't build the vehicle, industry will. NASA will be a user, not an operator."

Goldin said the objective of the RLV technology program is simple. "We want to develop technologies that will allow industry to build a vehicle that takes days, not months, to turnaround; dozens, not thousands of people to operate; reliability ten times better than anything flying today; and launch costs that are a tenth of what they are now. Our goal is a reusable launch vehicle that will cut the cost of a pound of payload to orbit from $10,000 to $1,000."

"The X-33 will be about half the size of a full-scale RLV. It will be a remotely-piloted, sub-orbital vehicle, capable of altitudes up to 50 miles and speeds of Mach 15," said RLV Director Gary Payton.

"The X-33 test vehicle is the most advanced part of a three-pronged RLV program to develop and demonstrate the kinds of technologies required by industry to build a new launch system that will provide truly affordable and reliable access to space," Payton said. "The RLV approach is to design a little, build a little, test a little, fly a little."

Sega leaves JSC to teach

Astronaut Ron Sega left NASA to rejoin the faculty at the University of Colorado at Colorado Springs.

Sega had been on an extended leave from the university and returns as dean of Engineering and Applied Science.

"We are sorry to see Ron leave," said David Leestma, director of Flight Crew Operations. "His knowledge, hard work and dedication will be missed."

Ron Sega

Sega was selected as an astronaut in 1990, making his first shuttle flight in 1994 aboard *Discovery*, the first joint U.S./Russian shuttle mission. STS-60 was the second flight of the Spacehab-2, and the first of the Wake Shield Facility.

From November 1994 to March 1995, Sega served as Director of Operations, Russia, responsible for managing NASA activities supporting astronaut and cosmonaut training for flight on the Russian Mir Space Station. He also participated in training on Russian Space Systems and was the first American to train in the Russian Orlan suit in their underwater facility.

His second shuttle flight was in 1996 as payload commander for the third docking mission to Mir. Following rendezvous and docking, Sega and his crewmates delivered Cosmonaut Researcher Shannon Lucid to Mir to begin a two-year continuous presence of U.S. astronauts on the Russian outpost.

STS-78 Mission Specialist Chuck Brady holds an unlit Olympic Torch while exercising on the bicycle ergometer in the Spacelab. He was joined by his crewmates—Commander Tom Henricks, Pilot Kevin Kregel, Mission Specialists Susan Helms and Rich Linnehan and Payload Specialists Jean-Jacque Favier and Bob Thirsk—on board *Columbia* in an informal salute to the 1996 Olympics which open July 19 in Atlanta. *Columbia* is expected to set a record for the longest shuttle flight when it lands at 7:38 a.m. JSC time Sunday.

Mir crew praises STS-78 work

By Natasha Calder

American Cosmonaut Researcher Shannon Lucid and her Russian Mir crewmates talked with the Space Shuttle *Columbia* astronauts this week to congratulate them on their ongoing mission.

Lucid and her Mir crewmates — Commander Yuri Onufrienko and Flight Engineer Yuri Usachev — expressed regrets Wednesday that the two crews would not have a chance to work together.

"We welcome our neighbors in space," Onufrienko said. "We would like to wish you successful completion of the experiments which study the effects of weightlessness on human beings."

STS-78 Commander Tom Henricks voiced his appreciation for the success of the Mir 21's crew space walks. "We wish to congratulate you on your continued success during this long duration mission," he said.

Lucid reflected on the international flavor of the crews currently in low-Earth orbit. "It's really great to talk to you Tom and hearing all about your crew. We really have an international group up here. It's to bad we can't get a little closer and talk a little longer," she said.

Lucid also was involved in an online conference with students from the Manhattan School for Children in New York City last week. During this first ever online interview hosted by NASA,

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Columbia to land Sunday, record in hand

By Karen Schmidt

The STS-78 astronauts are scheduled to return to Earth on Sunday with a record for the longest space shuttle flight in history.

Commander Tom Henricks, Pilot Kevin Kregel, Mission Specialists Susan Helms, Rich Linnehan and Chuck Brady and Payload Specialists Jean-Jacques Favier and Bob Thirsk received word Saturday that mission managers extended their mission to 17 days.

"*Columbia*, Houston," said Spacecraft Communicator Chris Hadfield. 'Your mission, and we know you'll be glad to accept it, is to extend to 17 days on orbit. Congratulations."

Columbia will break the previous record held by *Endeavour* on STS-67, which flew in March 1995. That flight lasted 16 days, 15 hours. STS-78 is expected to last 16 days, 21 hours. The record will be broken in the early morning hours Sunday as the crew prepares for reentry. *Columbia* is expected to return to Kennedy Space Center's Shuttle Landing Facility at 7:38 a.m. CDT Sunday with the crew arriving at Ellington Field later in the afternoon.

"The experiments and orbiter systems keep everything mentally challenging and the days literally fly by," Henricks said.

Wednesday, the STS-78 crew achieved a radio link with the Mir 21 crew—Commander Yuri Onufrienko, Flight Engineer Yuri Usachev and Cosmonaut Researcher Shannon Lucid—to discuss its work in low-Earth orbit.

"This is an international event, having spacecraft from two nations both flying foreign visitors in a peaceful endeavor for research in space," Henricks said. "Another peaceful endeavor which should make

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Atlantis work on target for fourth docking flight

The fourth Phase 1 docking mission and the first shuttle retrieval of an American from the Russian Mir Space Station are on schedule for a July 31 launching following this week's routine hot-fire of a replacement auxiliary power unit on *Atlantis*.

Commander Bill Readdy and a crew of six is set to lift off at 10:29 a.m. CDT July 31 from Kennedy Space Center's Launch Pad 39A. The launch window is 7 to 10 minutes long.

The crew–except for Mission Specialist John Blaha–will spend 8 days, 20 hours and 35 minutes in orbit, and land about 7:05 p.m. Aug. 9 at KSC. On arrival at Mir, Blaha will begin a stay of four months as a cosmonaut researcher. He will replace astronaut Shannon Lucid, who has been part of the Mir 21 crew since March. Lucid, by then the American long-duration space flight record holder, will return to Earth with the STS-79 crew.

Mir 22 Commander Gennady Manakov, Flight Engineer Pavel Vinogradov and French Cosmonaut Researcher Claudie Andre-Deschays are scheduled to join Blaha aboard Mir on Aug. 16 to begin what is expected to be a six-month mission.

Work this week at KSC included launch pad validations and a main engine flight readiness test. The helium signature leak check for the main engines is scheduled for

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JSC Photo by Robert Markowitz

X-CRV—The Experimental Crew Return Vehicle Office, in cooperation with the Astronaut Office and the Flight Surgeon's office, conduct a variety of tests on an experimental crew return vehicle during zero-g parabolas in the KC135. From left are Deputy Project Manager Merri Sanchez, Astronaut Kalpana Chawla and Project Manager John Muratore. Tests included ingress, egress, reach and visibility of medical equipment, seats and hatches.

JSC videos win Telly awards

JSC garnered accolades for excellence in video productions at the 1996 Telly Awards.

Taft Broadcasting Co. and Media Services Corp. received four awards in the national competition that recognizes excellence in non-network television, cable, film and video productions. The total number of entries was more than 9,000, including The Disney Channel, Coca-Cola, Nike, National Geographic and others.

In the education category, the winner was Taft's "Microgravity." This educational program, hosted by astronaut Jan Davis, explains to students what microgravity is, how it is achieved and why it is such an ideal setting for many types of scientific research. The program is a part of the Lift-Off To Learning educational series which is created by the JSC Education Working Group for national distribution to teachers and students.

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